

## Claims

- [c1] What is claimed is:
- 1.A method for improving the reliability of shallow trench isolation(STI), the method comprising:
- providing a substrate having a top surface;
- forming a trench-patterned mask layer on the top surface exposing an unmasked trench region of the substrate, the mask layer comprising a pad oxide layer, and a silicon nitride layer formed on the pad oxide layer;
- etching the unmasked region of the substrate to form a trench in the substrate;
- simultaneously oxidizing the silicon nitride layer and the substrate of the trench to form an in-situ steam growth (ISSG ) film;
- depositing a dielectric layer to fill the trench and cover the mask layer;
- planarizing the dielectric layer to expose the silicon nitride layer; and
- stripping the silicon nitride;
- wherein the ISSG film reinforces an interface between the dielectric layer and the substrate to prevent acid penetration and acid-corroded seams being formed during the acid solution dipping process.
- [c2] 2.The method of claim 1 wherein the ISSG film is formed by an in-situ steam growth (ISSG) method.
- [c3] 3.The method of claim 1 wherein the ISSG film has a thickness between 50 and 250 angstroms.
- [c4] 4.The method of claim 1 wherein the dielectric layer is an HDP (high density plasma, HDP) oxide layer.
- [c5] 5.The method of claim 1 wherein before stripping the silicon nitride layer, the method further comprises performing a silicon oxide etching process to remove residual silicon oxide on the silicon nitride layer and simultaneously etch the dielectric layer of the trench.
- [c6] 6.The method of claim 1 wherein the acid solution dipping process uses DHF (diluted HF) solution.
- [c7] 7.The method of claim 1 wherein the silicon nitride layer is stripped by a 160 ° C

Country	Year	Value	Unit	Source
Algeria	1980	1.00	1000	FAO
Algeria	1981	1.00	1000	FAO
Algeria	1982	1.00	1000	FAO
Algeria	1983	1.00	1000	FAO
Algeria	1984	1.00	1000	FAO
Algeria	1985	1.00	1000	FAO
Algeria	1986	1.00	1000	FAO
Algeria	1987	1.00	1000	FAO
Algeria	1988	1.00	1000	FAO
Algeria	1989	1.00	1000	FAO
Algeria	1990	1.00	1000	FAO
Algeria	1991	1.00	1000	FAO
Algeria	1992	1.00	1000	FAO
Algeria	1993	1.00	1000	FAO
Algeria	1994	1.00	1000	FAO
Algeria	1995	1.00	1000	FAO
Algeria	1996	1.00	1000	FAO
Algeria	1997	1.00	1000	FAO
Algeria	1998	1.00	1000	FAO
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Algeria	2001	1.00	1000	FAO
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Algeria	2006	1.00	1000	FAO
Algeria	2007	1.00	1000	FAO
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Algeria	2011	1.00	1000	FAO
Algeria	2012	1.00	1000	FAO
Algeria	2013	1.00	1000	FAO
Algeria	2014	1.00	1000	FAO
Algeria	2015	1.00	1000	FAO
Algeria	2016	1.00	1000	FAO
Algeria	2017	1.00	1000	FAO
Algeria	2018	1.00	1000	FAO
Algeria	2019	1.00	1000	FAO
Algeria	2020	1.00	1000	FAO
Algeria	2021	1.00	1000	FAO
Algeria	2022	1.00	1000	FAO
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Algeria	2028	1.00	1000	FAO
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Algeria	2039	1.00	1000	FAO
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Algeria	2042	1.00	1000	FAO
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Algeria	2047	1.00	1000	FAO
Algeria	2048	1.00	1000	FAO
Algeria	2049	1.00	1000	FAO
Algeria	2050	1.00	1000	FAO
Algeria	2051	1.00	1000	FAO
Algeria	2052	1.00	1000	FAO
Algeria	2053	1.00	1000	FAO
Algeria	2054	1.00	1000	

[c8]

8. The method of claim 1 wherein the substrate is a silicon substrate.